

FLEXIBLE MAGNETIC DISC WITH A TWO LAYER PROTECTIVE COATING WHICH TOP LAYER IS A ULTRA VIOLET RADIATION CURED COMPOUND WITH SPECIFIED ELASTICITY MODULUS

FIELD OF THE INVENTION

The present invention relates to flexible magnetic discs, and more particularly to a flexible magnetic disc capable of being mounted on a writing/reading apparatus without being eccentric thereto.

BACKGROUND OF THE INVENTION

A magnetic disc sheet has been heretofore known which is adapted to be housed in a jacket and engaged with a sheet positioning member for a writing/reading apparatus at a central hole provided in both the jacket and the sheet so that when it is rotated by the sheet positioning member, magnetic recording is effected on the sheet or magnetic reproduction is effected from the sheet. Since this kind of a magnetic disc sheet is housed in a jacket with some margin, it may get out of position in the jacket in storage, handling or carriage, causing the central hole of the sheet to be eccentric to the position of the positioning member (collet) in the writing/reading apparatus when mounted in the writing/reading apparatus. This may cause the disc sheet to be held in an eccentric position when it is positioned.

FIGS. 1A and 1B illustrate this kind of a flexible magnetic sheet. In a rectangular jacket 1 having a circular opening 1a at the central portion thereof, a flexible magnetic sheet 2 is rotatably housed with the periphery of its central hole 2a exposed in the central circular opening 1a.

When this flexible magnetic disc is mounted in the writing/reading apparatus, the collet 4 is lowered down and pressed into a circular concavity 3a of a rotary portion 3 of the positioning member with the rotary portion 3 held to the bottom surface of the sheet 2, as shown in FIG. 2. The periphery of the central hole 2a of the sheet 2 does not necessarily coincide in position with the circular concavity 3a of the rotary portion 3 and may often get out of position. If the collet 4 is lowered down in such a situation, part of the periphery of the circular hole 2a of the sheet 2 is caught in between the collet 4 and the concavity 3a of the rotary portion 3 as illustrated by FIG. 3, causing the sheet 2 to rotate eccentrically. When the magnetic disc sheet 2 does not keep rotating with its center coinciding with the rotary axis, writing and reading cannot be properly conducted. Therefore, the magnetic disc sheet should be prevented from being held in such an eccentric position. Furthermore, if the magnetic disc sheet is held and rotated in such an eccentric position, it may lose flatness, causing shaky rotation. In order to properly mount the sheet 1 as shown in FIG. 4 (rather than FIG. 3) when the collet 4 is lowered down to clamp the sheet 2, it is necessary that the periphery of the central circular hole of the sheet has a proper rigidity and the coefficient of friction (μ) of the sheet 2 with the collet 4 and the rotary portion 3 be small.

To this end, JP-A-57-113,422, 60-22,785 and 60-25,074 (the term "JP-A" as used herein means an "unexamined published Japanese patent application") disclose an approach which comprises providing a protective layer comprising an ultraviolet-polymerizable polyolefin material and an aliphatic ester on a portion of

the periphery of the central circular hole of a flexible magnetic disc with which the sheet-positioning member is brought into contact to reduce the coefficient of friction therebetween.

However, such a protective layer merely composed of an ultraviolet-curing resin leaves much to be desired. In particular, if flexible magnetic discs are piled up with such protective layers brought into contact with each other during preparation, these protective layers may become glued to each other to cause blocking due to its flatness or softness.

If a flexible magnetic disc has been clamped in a floppy disc drive under the circumstances of high humidity and temperature over an extended period of time, such a protective layer may adhere to the rotary portion or the collet.

In order to overcome this problem, the resin to be contained in the protective layer may be hardened or may be mixed with a filler as disclosed in JP-A-60-234,273.

However, if the resin is hardened, its adhesion to the magnetic layer on the flexible magnetic disc is lowered, possibly causing the protective layer to fall off during use. If the resin contains a filler, the filler often absorbs ultraviolet light, preventing the resin from thoroughly curing.

An approach which comprises using an epoxy resin, synthetic rubber or the like as a ultraviolet-curing resin for the protective layer is disclosed in JP-B-U-57-28,298 (the term "JP-B-U" as used herein means an "examined Japanese utility model publication"). However, even by this approach, it is still difficult to attain an excellent adhesion to the magnetic layer while inhibiting the adhesion between the protective layers. A protective layer composed of such a resin is also disadvantageous in that it is liable to be damaged.

SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a flexible magnetic disc which exhibits a small coefficient of friction with a positioning member and thus can be mounted in a writing/reading apparatus without being eccentric thereto and does not stick to each other when piled up on one another.

The above and other objects of the present invention will become more apparent from the following detailed description and examples.

These objects of the present invention are accomplished with a flexible magnetic disc comprising a protective layer on the periphery of a central hole, wherein said protective layer comprises two layers, the lower one of said two layers being a composition mainly composed of a printing ink and the upper one being a composition mainly composed of a resin obtained by irradiating a radiation-polymerizable compound with radiation so that it cures.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a plan view illustrating an example of a flexible magnetic disc;

FIG. 1B is a section of FIG. 1A;

FIG. 2 is a partially sectional view illustrating how a flexible magnetic disc is mounted in a positioning apparatus in a writing/reading apparatus;

FIG. 3 is a partially sectional view illustrating a sheet held eccentric to the writing/reading apparatus;